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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,784	06/30/2003	Erji Mao	78286 (P1659 US)	5302

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ALLEN, DYER, DOPPELT, MILBRATH & GILCHRIST P.A.  
1401 CITRUS CENTER 255 SOUTH ORANGE AVENUE  
P.O. BOX 3791  
ORLANDO, FL 32802-3791

EXAMINER

PETKOVSEK, DANIEL J

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/611,784

Applicant(s)

MAO ET AL.

Examiner

Daniel J Petkovsek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on application filed June 30, 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on June 30, 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/30/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

This application claims benefit of 60/392,298, filed July 1, 2002.

### *Information Disclosure Statement*

1. The prior art document submitted by Applicant in the Information Disclosure Statements filed on June 30, 2003, has been considered and made of record (note attached copy of forms PTO-1449).

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 5-8, and 13-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Sulhoff et al. U.S.P. No. 6,687,049 B1.

Sulhoff et al. U.S.P. No. 6,687,049 B1 teaches (ABS, Figs. 7b, 15, column 11, lines 3-50) a variable optical apparatus 50 comprising: an optical fiber waveguide 52 for transmitting a plurality of optical signals on channels at different wavelengths, at least first 54 and second 56 Raman pump sources having different wavelengths, providing variable optical signals to the waveguide, an optical power monitor (38, 42) to measure optical signals, and a pump controller 44, using linear functions and equations to correlate power levels, and having the ability to control/modify the pumps (38, 42) in response to create desired optical pumping power levels based upon the tapped feedback.

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Regarding claim 8 and method claim 1, the corresponding values (gain profile, 1<sup>st</sup> and 2<sup>nd</sup> pump power values according to linear function) must be predetermined for the control unit to function effectively during the tapping, detecting, and providing pump (1<sup>st</sup> and 2<sup>nd</sup>) power control. Regarding claim 2, integrated measuring is inherently used. Regarding claims 5 and 6, the wavelength monitoring inherently needs to be correlated to the corresponding Raman pump source, during any tapping and detection, in use with the equations present.

Regarding claims 13 and 14, both distributed and discrete Raman gains are used. Regarding claim 15, energy counter propagates.

Regarding independent claim 16, the limitations are met herewith, in accordance with the limitations of claim 7.

4. Claims 1, 2, 5-8, and 13-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Seydnejad et al. U.S.P. No. 6,697,187 B2.

Seydnejad et al. U.S.P. No. 6,697,187 B2 teaches (ABS, Fig. 6, SUM, CLMs) an optical amplifier 8 for providing dynamic gain control comprising: an optical waveguide 12 for transmitting a plurality of optical signals on channels at different wavelengths, at least first and second Raman pump sources (18, 20, 22, 24) having different wavelengths optical coupled to the waveguide to provide variable optical pump power, an optical power monitor (see column 1, line 63 through column 2, line 8) that empirically measures/monitors the channels, and a pump controller 30 that compares the desired results (in a linear function) to the actual measured results, and adjusts the pump power of

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the plurality of pumps in order to create desired changes in the optical amplification system.

Regarding claim 8 and method claim 1, the corresponding values (gain profile, 1<sup>st</sup> and 2<sup>nd</sup> pump power values according to linear function) must be predetermined for the control unit to function effectively during the tapping, detecting, and providing pump (1<sup>st</sup> and 2<sup>nd</sup>) power control. Regarding claim 2, integrated measuring is inherently used.

Regarding claims 5 and 6, the wavelength monitoring inherently needs to be correlated to the corresponding Raman pump source, during any tapping and detection, in use with the equations present.

Regarding claims 13 and 14, both distributed and discrete amplification is discussed in Seydnejad et al. '187. Regarding claim 15, energy counter propagates.

Regarding independent claim 16, the limitations are met herewith, in accordance with the limitations of claim 7.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 4, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sulhoff et al. U.S.P. No. 6,687,049 B1.

Sulhoff et al. U.S.P. No. 6,687,049 B1 teaches (ABS, Figs. 7b, 15, column 11, lines 3-50) a variable optical apparatus 50 comprising: an optical fiber waveguide 52 for transmitting a plurality of optical signals on channels at different wavelengths, at least

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first 54 and second 56 Raman pump sources having different wavelengths, providing variable optical signals to the waveguide, an optical power monitor (38, 42) to measure optical signals, and a pump controller 44, using linear functions and equations to correlate power levels, and having the ability to control/modify the pumps (38, 42) in response to create desired optical pumping power levels based upon the tapped feedback.

Sulhoff et al. '049 does not explicitly teach the specific method of measuring by using signal modulation (claim 3) or by monitoring back reflection (claim 4). These forms of measuring are well known to a person having ordinary skill in the fiber optical amplification art, and would have been obvious analogous ways to measure the optical pump power and signal level values. These methods of measuring have advantages in the art, such as improving efficiency and amplification utility in monitoring a signal by the use of a variety of different means, including both signal modulation and/or back reflection.

Sulhoff et al. '049 does not explicitly teach that the optical power monitor is a photodiode (claims 9-12). Sulhoff et al. '049 teaches using photodetectors for measuring purposes. It is well known in the art that photodiodes are often used as photodetectors to efficiently measure and report values in optical amplifiers. Using a photodetector such as a photodiode can improve measuring capabilities in the art and simplify the overall functionality (reduce price). Regarding claims 10-12, filters are used to separate desired wavelength components for the measuring and testing purposes, in correlation with the linear functions to control the controller.

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7. Claims 3, 4, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seydnejad et al. U.S.P. No. 6,697,187 B2.

Seydnejad et al. U.S.P. No. 6,697,187 B2 teaches (ABS, Fig. 6, SUM, CLMs) an optical amplifier 8 for providing dynamic gain control comprising: an optical waveguide 12 for transmitting a plurality of optical signals on channels at different wavelengths, at least first and second Raman pump sources (18, 20, 22, 24) having different wavelengths optical coupled to the waveguide to provide variable optical pump power, an optical power monitor (see column 1, line 63 through column 2, line 8) that empirically measures/monitors the channels, and a pump controller 30 that compares the desired results (in a linear function) to the actual measured results, and adjusts the pump power of the plurality of pumps in order to create desired changes in the optical amplification system.

Seydnejad et al. '187 does not explicitly teach the specific method of measuring by using signal modulation (claim 3) or by monitoring back reflection (claim 4). These forms of measuring are well known to a person having ordinary skill in the fiber optical amplification art, and would have been obvious ways (analogous) to measure the optical pump power and signal level values. These methods of measuring have advantages in the art, such as improving efficiency and amplification utility in monitoring a signal by the use of a variety of different means, including both signal modulation and/or back reflection.

Seydnejad et al. '187 does not explicitly teach that the optical power monitor is a photodiode (claims 9-12). Seydnejad et al. '187 is silent as to the exact means used for detection of the optical power from the amplification module. It is well known in the art

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that photodiodes are often used as photodetectors to efficiently measure and report values in optical amplifiers. Using a photodetector such as a photodiode can improve measuring capabilities in the art, and simplify the overall functionality (reduce price). Regarding claim 10-12, filters can be used to separate desired wavelength components for the measuring and testing purposes, in correlation with the linear functions to control the controller. Each desired wavelength must be measured and tested to correlate to a desired modification of the power levels of the pumps.

### *Inventorship*

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

### *Conclusion*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, with respect to the state of the art of optical amplifiers using a plurality of Raman pumps, in correlation with feedback to control these pumps: PTO-892 form references C-G.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Petkovsek whose telephone number is (571) 272-2355. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel Petkovsek  
February 15, 2005



AKM ENAYET ULLAH  
PRIMARY EXAMINER